What is claimed is:

1. A manufacturing method of a semiconductor device comprising the steps of:

forming an insulating film over a semiconductor substrate;

exciting a plasma of a gas having a molecular structure in which hydrogen and nitrogen are bonded and irradiating the plasma onto the insulating film;

forming a self-orientation layer made of substance having a self-orientation characteristic on the insulating film; and

forming a first conductive film made of conductive substance having the self-orientation characteristic on the self-orientation layer.

2. A manufacturing method of a semiconductor device according to claim 1, wherein the gas is an ammonia gas.

3. A manufacturing method of a semiconductor device according to claim 1, wherein, after the plasma is irradiated onto the insulating film, the self-orientation layer is formed on the insulating film while maintaining a state that the insulating film is put in a vacuum atmosphere.

4. A manufacturing method of a semiconductor device according to claim 3, wherein a pressure of the vacuum atmosphere is set to 1×10^{-3} Torr or less.

5. A manufacturing method of a semiconductor device according to claim 1, wherein a surface of the insulating

film is dehydrated after the plasma is irradiated onto the insulating film and before the self- orientation layer is formed.

6. A manufacturing method of a semiconductor device according to claim 5, wherein removal of a moisture is executed by coating alcohol on the first conductive film.

7. A manufacturing method of a semiconductor device according to claim 1, wherein the self- orientation layer is formed of any one of titanium, aluminum, silicon, copper, tantalum, tantalum nitride, iridium, iridium oxide, and platinum.

8. A manufacturing method of a semiconductor device according to claim 1, wherein the first conductive film is formed of any one of titanium, aluminum, silicon, copper, tantalum, tantalum nitride, iridium, iridium oxide, and platinum.

9. A manufacturing method of a semiconductor device according to claim 1, wherein the first conductive film is formed by any one of a sputter method, a plasma CVD method, an MOCVD method, and a plating method.

10. A manufacturing method of a semiconductor device according to claim 1, further comprising the step of forming a conductive pattern by patterning the first conductive film and the self-orientation layer.

11. A manufacturing method of a semiconductor device according to claim 10, wherein the conductive pattern is any one of an electrode and a wiring.

12. A manufacturing method of a semiconductor device according to claim 10, further comprising the step of:

forming a hole under a part of the insulating film in a region in which the conductive pattern is to be formed, and forming a conductive plug in the hole before the plasma is irradiated onto the insulating film.

13. A manufacturing method of a semiconductor device according to claim 10, wherein an island-like oxygen barrier metal that is exposed from the insulating film is formed on a part of the region in which the conductive pattern is to be formed, and a conductive plug is formed under the oxygen barrier metal.

14. A manufacturing method of a semiconductor device according to claim 1, further comprising the steps of:

forming a capacitor lower electrode on the conductive plug and a peripheral area by patterning the self- orientation layer and the first conductive film;

forming sequentially an oxidation-preventing insulating film and an adhesive insulating film on the capacitor lower electrode and the insulating film;

polishing the adhesive insulating film and the oxidation-preventing insulating film to expose an upper surface of the capacitor lower electrode;

forming an overlying conductive film made of a same material as the first conductive film on the adhesive

insulating film, the oxidation-preventing insulating film, and the capacitor lower electrode;

forming a ferroelectric film on the overlying conductive film;

forming a second conductive film on the ferroelectric film; and

patterning the second conductive film, the ferroelectric film, and the overlying conductive film to form a capacitor shape that coincides with the capacitor lower electrode.

15. A manufacturing method of semiconductor device according to claim 1, further comprising the steps of:

forming a ferroelectric film on the first conductive film;

forming a second conductive film on the ferroelectric film;

forming a capacitor upper electrode by patterning the second conductive film;

patterning the ferroelectric film to leave at least under the capacitor upper electrode; and

forming the capacitor lower electrode at least below the capacitor upper electrode by patterning the first conductive film and the self-orientation layer.

16. A manufacturing method of a semiconductor device according to claim 14, further comprising the steps of:

crystallizing the ferroelectric film by a heat in

an oxygen atmosphere after the ferroelectric film is formed; and

annealing the ferroelectric film via the second conductive film by the heat in the oxygen atmosphere after the second conductive film is formed.

17. A manufacturing method of a semiconductor device according to claim 14, wherein the second conductive film has two steps of forming a lower conductive film and an forming upper conductive film, and

further comprising the step of:

annealing the ferroelectric film in an oxygen atmosphere before and after formation of the lower conductive film respectively.

18. A manufacturing method of a semiconductor device according to claim 14, wherein the ferroelectric film is formed of either PZT or PZT into which at least one of calcium, strontium, and lanthanum is doped.

19. A manufacturing method of a semiconductor device according to claim 14, wherein the ferroelectric film is formed by any one of a spin-on method, a sol-gel method, a MOD method, and a MOCVD method.

20. A manufacturing method of a semiconductor device according to claim 19, wherein, when the ferroelectric film is formed by the MOCVD method, a substrate temperature is set to 600 to 650 ℃.

21. A manufacturing method of a semiconductor device according to claim 20, wherein more than 90 % of

grains constituting the ferroelectric film have a (111) orientation.